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EXAMINER	
CHANG, AUDREY Y	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/990,237	SUGANUMA, HIROSHI	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on September 14, 2005, which has been entered into the file.
- By this amendment, the applicant has amended claims 1-14 and has newly added claims 15-17.
- Claims 1-17 remain pending in this application.
- The substitute specification submitted April 6, 2005, STILL are **not accepted** for the reasons stated in the previous Office Action.

Response to Amendment

1. The amendment filed **September 14, 2005** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **claim 1 has been amended** to include the phrase "a spatial modulation section that controls the ... in association with the Fourier transformed data". **Claim 3 has been amended** to include the phrase "the second scan unit scanning the modulated light in said arraying direction". **Claim 7 has been amended** to include the features concerning the "scanning the modulated light in said first direction and in a second direction" where in the first direction is spatial modulation direction of the light. **Claim 7 also has been amended** to include "means for receiving image data corresponding to the coherent light". **Claim 8 has been amended** to include the phrase "Fourier transforming image data associated with said light". **Claim 13 has been amended** to include the phrase "scanning ... said *first* direction".

The specification fails to teach a "*spatial modulation section*" and fails to teach the "association" with the Fourier transformed data in *driving* the modulation elements. "Spatial modulation" is in general

referred to modulation of the light beam in the spatial variation sense. Not an electronic circuit for *driving* the element.

The applicant is also reminded that the direction of scanning is the actual directions of the light on the diffuser. Since the diffuser (37) assuming to be two dimensional is perpendicular to the direction of the modulation of the GLV (32), the scanning direction of the light CANNOT be parallel to the direction of the modulation (or so called first direction in claim 13) or arraying direction, since if this is the case, the modulated light WILL NOT be able to reach the diffuser.

The specification further fails to teach to have a "means for receiving image data *correspond* to the coherent light". Image data receiving has nothing to do with the coherent light, (as shown in Figure 4).

The specification fails to teach the image data be associated with the coherent light as it is Fourier transformed, (please see Figure 4). Fourier transformation of the image data has nothing to do with the coherent light sources (31a to 31c).

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1-5, 7-10, 11-15 and 17 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on newly added matters are set forth in the paragraph above.

4. **Claims 1-5, 8-10, 11-15 are rejected under 35 U.S.C. 112, first paragraph**, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1 and 8 have been amended to include the feature "Fourier transformation of image data" however the specification and the claims fail to teach what exactly is the Fourier transformation of the image data. Namely, since Fourier transformation is a mathematical transformation of a function from one space (such as spatial space) to another space (such as wave number space), it is not clear what kind of the transformation is being done here and the transformed image data is in what domain space. It is rather important to know such since the image data function in one domain space will have *recognizable* image in a different domain space will not have *recognizable* image. It is therefore not clear if the transformed image data is recognizable or not by the naked eyes, the claims and the specification FAIL to teach such to make it clear and to make any Fourier transformed image be viewed as recognizable image.

Clarifications are certainly required.

Claim Objections

5. Claims 1-17 are objected to because of the following informalities:

(1). **Claim 1 has been amended** to include the feature concerning "*controller*" however the claim **fails** to provided the *logical relationship* between the controller and the rest of the elements to make the display a workable device. **Claim 1 and its dependent claims** therefore are **incomplete**. In particular, what is the "*reference signal*" and what function does this reference signal have in relating to the rest of the elements and function of the display apparatus. How can the image data be "associated" with the light since it appears the Fourier transformation is done before the light even reaches the spatial

modulator? How does this *association* occurs before the light even exists. What is this Fourier transformation and what is the transformed image data as relate to image data? Where does this image data come from? Why does the transformation needed? Can this *transformed* image be *viewed* by the observer? What is this "spatial modulation section"? Does it *modulate* the light or not? What are these "modulation elements" how do they relate to the spatial modulator recited before? Furthermore, how does this transformed image data relate to the rest of the elements of the display apparatus? The image display apparatus without the controller only discloses to scan **the light** (what is this light?) back and forth or something. No workable image display apparatus has been disclosed in the claims.

(2). The phrase "scan unit axis" recited in various claims is confusing and indefinite since it is not clear if this referred to the scanning direction or the rotational axis of the scanning unit. *This phrase has been objected in the previous Office Action.*

(3). The phrase "Fourier surface" recited in amended claim 6 is confusing since it is not clear what is this phrase referred to? Is this referred to the "Fourier plane" which is the focal plane of the Fourier lens or the surface of the Fourier lens? Figures 4 and 5, fails to disclose that the diffuser is at the focal plane of the Fourier lens. It is therefore not clear what is considered to be this Fourier surface? *It is being examined as any surface that at the downstream of the Fourier transformation lens.*

(4). The **amended phrase** "means for receiving image data corresponding to the coherent light" recited in **claim 7** is completely confusing and indefinite since it is not clear how does the image data be received "*corresponding* to the coherent light". Also it appears the image data and the "means for receiving image data" has *nothing to do* with the rest of the elements of the image display apparatus. The claim therefore is incomplete.

(5). The **amended phrase** "Fourier transforming image data associated with said light" recited in **claim 8** is completely wrong and confusing since the image data is NOT associated with the coherent

light at all when transformation is performed. Furthermore, there is no logical connection between this transformed image data with the rest of the image display. This claim therefore is incomplete.

(6). **Claim 9 has been amended** to include the phrase "so that the light from the light source is reflected by the polygon mirror and the hologram device in this order". However this phrase is confusing since it is not clear how does this scan unit and *this order* is possible to scan the light in a first direction as required by the based claim 1. It appears that the light will be scanned in at least two directions.

(7). It is not clear if the rotation of the modulator, as recited in claim 14, achieves the scanning function as stated in its based claim. The objection is *repeated* from the previous Office Action.

The claim language as stands now are *confusing* and the elements in the claims are *loosely related to each other* that fail to provide **logical relationship** to makes the scopes of the claims are clear and indefinite. The applicant is *respectfully requested* to correct **all** the discrepancies and errors in the claims to make them in comply with the requirements of 35 USC 112, paragraphs.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bloom et al (PN. 6,215,579) in view of the patent issued to Liu (PN. 6,043,652).

Claim 1 has been significantly amended and that necessitates the new grounds of the rejection.

Bloom et al teaches an *image display system* (400, Figure 14) wherein the system is comprised of a *light source having LEDs* (404R, 404G, 404B) for *generating laser beams having* wavelengths in predetermined ranges of red, green and blue color. The laser beams illuminate a *Grating Light Valve* (402), which is an *one-dimensional spatial light modulator*, (please see Figure 10 for its one dimensional arrangement) for modulating the laser beams. The modulated laser beams are then *scanned* by a *scanning mirror* (432) to the *direction* and then the location of an observer (434) for displaying **an image**, (please see Figure 14, and columns 7-12). Bloom et al teaches that the one-dimensional grating light valve has a plurality of *one-dimensionally arrayed elements* (200, Figures 7-18) that each of the elements has a *top surface* defined between the post position (110) and the top surface is selected to move upward and downward for modulating the light. The elements are *selectively* driven by applying the voltage and which means they could be independently driven.

Claim 1 has been amended to include a controller including a clock, a Fourier transformation section and a spatial modulator section. However the claim fails to provide logical relationships between this controller and the rest of the display apparatus to make the scopes clear and definite for the reasons stated above. They can only be examined in the broadest interpretation.

Bloom et al teaches the display apparatus comprises a *control circuitry* (440, Figure 14) that is arranged to receive video data or image data *coupled* to the GLV array for using the image data or video data to *operate* the elongated GLV elements (200), which therefore includes the "*spatial modulation section*" for driving the modulation elements or the GLV elements (200). The electronic control circuitry also is *coupled* to the scanning mirror drive unit (436) to *synchronize* the display of sequential lines which is a cooperation between the GLV and scanning mirror, this means certain kind of *clock* with *referee signal* is included for achieving this synchronization, (please see column 10, lines 43-59). This reference however does not teach about having a Fourier transformation section for Fourier transforming the image data. However it is not clear what is this transformation for and how does it affect the image data. This

transformation is therefore being examined as arbitrary image processing step. It is very well known in the art to apply Fourier transformation on image data in the process of processing the image data to better fit for the display purpose as demonstrated by **Liu** wherein a Fourier transformation (224, Figure 5) is performed in the process of processing the image data before it is fed to the display device (230, Figure 5). Fourier transformation has the advantage of reducing data points for processing. It would then have been obvious to one skilled in the art to apply the teachings of **Liu** to include such process in the display apparatus of Bloom et al for the advantage of reducing data points for processing before being displayed by the GLV so that better image quality can be achieved.

8. **Claims 7-8 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Kajiki (PN. 5,694,235) in view of the patent issued to Liu (PN. 6,043,652).**

Claims 7 and 8 have been significantly amended that necessitates the new grounds of rejections.

Kajiki teaches a *three dimensional image display apparatus*, (Figure 9) that is comprised of a *light source array* (17) for radiating coherent light, a *spatial light modulator* (19), that has the function of spatially modulating light of the source array in a *one-dimensional fashion*, (please see the one-dimensional arrangement of the modulated light from the modulator) and a *vertical scanning unit* (4) and a *polygon mirror scanning unit* (3) for scanning the modulated light to a predetermined direction of the observer (21) to enable three dimensional image observation, (please see columns 7 and 9). Kajiki teaches that the *vertical* scanner (4) and a *horizontal* scanner (3), which is a *polygonal mirror*, have scanning axes that are orthogonal to each other. The horizontal scanner (3) allows the horizontal parallax effect of the image is established and the vertical scanner (4) allows the vertical parallax effect of the image is established, (please see Figure 4). It is implicitly true that the directions of the scanning from both of the scanners, which referred to the actual direction of the light after the scanners, are also

orthogonal to each other and to the modulation elements, for creating two-dimensionally *extended* image at the viewer position. With regard to claim 13, Kajiki teaches that the two scanners have different scanning speeds, (please column 9, lines 45-54).

Claim 7 has been amended to include the feature "means for receiving image data corresponding to the coherent light" that is not supported by the specification. It is implicitly true that the there must be means for receiving image data to allow the image data be displayed used by the modulator to modulate the coherent light, (please see Figure 9).

Claim 8 has been amended to include the phrase "Fourier transforming image data associated with said light" is not supported by the specification since the image data is not associated with the light.

The *amended* feature concerning the "modulating is controlled in part according to a Fourier transformation of said image data" is indefinite and is rejected for the reasons stated above and it can only be examined in the broadest interpretation. This transformation is therefore being examined as arbitrary image processing step. It is very well known in the art to apply Fourier transformation on image data in the process of processing the image data to better fit for the display purpose as demonstrated by **Liu** wherein a Fourier transformation (224, Figure 5) is performed in the process of processing the image data before it is fed to the display device (230, Figure 5). Fourier transformation has the advantage of reducing data points for processing. It would then have been obvious to one skilled in the art to apply the teachings of **Liu** to include such process in the display apparatus of Kajiki for the advantage of reducing data points for processing before being displayed by the spatial modulator so that better image quality can be achieved.

With regard to claim 14, these references however do not teach explicitly to rotate modulator yet it is not clear if this means the rotation of the modulator achieve the scanning function. Since scanning of the modulated light is the essential criterion for the stereoscopic image display to occur, to use a scanner or to rotate the modulator itself will achieve the same scanning function, it would have been obvious to

one skilled in the art to modify the arrangement to rotate the modulator for achieving the scanning function for the benefit of eliminating the needs of the scanners.

9. Claims 1-5 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Kajiki (PN. 5,694,235) in view of the patents issued to Bloom et al (PN. 6,215,579) and Liu (PN. 6,043,652).

Claim 1 has been significantly amended that necessitates the new grounds of rejection.

Kajiki teaches a *three dimensional image display apparatus*, (Figure 9) that is comprised of a *light source array* (17) for radiating coherent light, a *spatial light modulator* (19), that has the function of modulating light of the source array in a *one-dimensional fashion*, (please see the one-dimensional arrangement of the modulated light from the modulator) and a *vertical scanning unit* (4) and a *polygon mirror scanning unit* (3) for scanning the modulated light to a predetermined direction of the observer (21) to enable three-dimensional image observation, (please see columns 7 and 9).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the spatial light modulator that modulates light in one-dimensional manner is a grating light valve (GLV) and does not teach explicitly that it has a plurality of one-dimensionally arrayed elements having top surfaces and the entire top surface of each elements is selectively moves upward and downward in the operation of the display. However grating light valve (GLV) is one of well known and widely used spatial light modulators in the art, as explicitly taught by **Bloom**. **Bloom** et al teaches an *image display system* (400, Figure 14) wherein the system is comprised of a *light source having LEDs* (404R, 404G, 404B) for *generating laser beams to* illuminate a *Grating Light Valve* (402), which is an *one-dimensional spatial light modulator*, (please see Figure 10 for its one dimensional arrangement) for modulating the laser beams. The modulated laser beams are then *scanned* by a *scanning mirror* (432) to the *direction* and then the location of an observer (434) for displaying **an image**, (please see Figure 14,

and columns 7-12). **Bloom** et al teaches that the *one dimensional grating light valve* has a plurality of *one-dimensionally arrayed elements* (200, Figures 7-18) that each of the elements has a *top surface* defined between the post position (110) and the top surface is selected to move upward and downward for modulating the light. The elements are *selectively* driven by applying the voltage and which means they could be independently driven as desired. It would then have been obvious to one skilled in the art to apply the teachings of **Bloom** to make the one dimensional modulator of **Kajiki** a grating light valve having the structure explicitly stated above for the benefit of allowing the modulation of the light from the light source array with greater efficiency and control which therefore ensure the image display quality.

Claim 1 has been amended to include a controller including a clock, a Fourier transformation section and a spatial modulator section. However the claim fails to provide logical relationships between this controller and the rest of the display apparatus to make the scopes clear and definite for the reasons stated above. They can only be examined in the broadest interpretation.

Bloom et al teaches the display apparatus comprises a *control circuitry* (440, Figure 14) that is arranged to receive video data or image data *coupled* to the GLV array for using the image data or video data to *operate* the elongated GLV elements (200), which therefore includes the "*spatial modulation section*" for driving the modulation elements or the GLV elements (200). The electronic control circuitry also is *coupled* to the scanning mirror drive unit (436) to *synchronize* the display of sequential lines which is a cooperation between the GLV and scanning mirror, this means certain kind of *clock* with *referee signal* is included for achieving this synchronization, (please see column 10, lines 43-59). This reference however does not teach about having a Fourier transformation section for Fourier transforming the image data. However it is not clear what is this transformation for and how does it affect the image data. This transformation is therefore being examined as arbitrary image processing step. It is very well known in the art to apply Fourier transformation on image data in the process of processing the image data to better fit for the display purpose as demonstrated by **Liu** wherein a Fourier transformation (224, Figure 5) is

performed in the process of processing the image data before it is fed to the display device (230, Figure 5). Fourier transformation has the advantage of reducing data points for processing. It would then have been obvious to one skilled in the art to apply the teachings of **Liu** to include such process in the display apparatus of Bloom et al for the advantage of reducing data points for processing before being displayed by the GLV or modulator so that better image quality can be achieved.

With regard to claims 2 and 3, Kajiki teaches that the scanning unit include a *vertical* scanner (4) and a *horizontal* scanner (3), which is a *polygonal mirror*, wherein the two scanners has scanning axes that are orthogonal to each other. The horizontal scanner (3) allows the horizontal parallax effect of the image is established and the vertical scanner (4) allows the vertical parallax effect of the image is established, (please see Figure 4). It is implicitly true that the directions of the scanning from both of the scanners, which referred to the actual direction of the light after the scanners, are also orthogonal to each other and to the modulation elements for creating two-dimensionally *extended* image at the viewer position.

With regard to claim 4, Kajiki teaches to use a *diffusion plate* for reproducing and displaying the stereoscopic image to the observer.

With regard to claim 11, Kajiki teaches that the vertical scanner (4) includes a galvano mirror (8) and the horizontal scanner (3) may also include a galvano mirror, (please see Figure 4, column 9, lines 45-54).

With regard to claim 12, Kajiki teaches explicitly that *collimator lens* (22, Figure 11 or 14a, 14b in Figure 13) is used to make the modulated light from the modulator *collimated* to each other before entering the scanning units. The modulated light after being scanned is focused and Fourier transformed by the lens (2) and is directed to a *diffusion plate* (20) for allowing the image being displayed.

10. Claims 9-10 and newly added claim 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Kajiki, Bloom et al and Liu as applied to claim 1 above, and further in view of the patent issued to Burr et al (PN. 5,550,779).

The three dimensional image display apparatus taught by **Kajiki** in combination of the teachings of **Bloom et al and Liu** have met all the limitations of the claims. Kajiki teaches that the scanning system comprises galvano mirror and polygonal mirror but it does not teach explicitly that is may also comprised staged mirror. The feature concerning the "volume hologram" is really not clear since the specification and the claims fail to give the proper structural relationship of the hologram with other elements of the display apparatus to determine the **function** of the volume hologram. It can only be examined with the broadest interpretation. **Burr** in the same field of the endeavor teaches a staged mirror, (14, 16 or 54) which can be diffractive grating elements (or therefore an holographic element), that is comprised of staged reflective elements, (please see Figures 2-4, 8 and 11) for directing light beam to different vertical direction. It would then have been obvious to one skilled in the art to modify the structure of Kajiki to use staged mirror as alternative means for scanning the light for the benefit of allowing more efficient control of the scanning of the light beams. The order of the scanning it not crucial since both the instant application and the cited Kajiki reference teaches to use the scanners to provide two dimensional image from one dimensional modulator.

11. **Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Kajiki (PN. 5,694,235) in view of the patents issued to Bloom et al (PN. 6,215,579)**

Kajiki teaches a *three dimensional image display apparatus*, (Figure 9) that is comprised of a *light source array* (17) for radiating coherent light, a *spatial light modulator* (19), that has the function of modulating light of the source array in a *one-dimensional fashion*, (please see the one-dimensional arrangement of the modulated light from the modulator) and a *vertical scanning unit* (4) and a *polygon*

mirror scanning unit (3) for scanning the modulated light to a predetermined direction of the observer (21) to enable three-dimensional image observation, (please see columns 7 and 9). Kajiki teaches explicitly that *collimator lens* (22, Figure 11 or 14a, 14b in Figure 13) is used to make the modulated light from the modulator *collimated* to each other. The modulated light after being scanned is focused and **Fourier transformed** by the lens (2) and is directed to a *diffusion plate* (20) for allowing the image being displayed. The diffusion plate is placed at the downstream of the Fourier transformation lens (2) and it is at the "surface" of the Fourier transformation lens in the sense of downstream of the lens.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the spatial light modulator that modulates light in one-dimensional manner is a grating light valve (GLV) and does not teach explicitly that it has a plurality of one-dimensionally arrayed elements having top surfaces and the entire top surface of each elements is selectively moves upward and downward in the operation of the display. However grating light valve (GLV) is one of well known and widely used spatial light modulators in the art, as explicitly taught by **Bloom**. **Bloom** et al teaches an *image display system* (400, Figure 14) wherein the system is comprised of a *light source having LEDs* (404R, 404G, 404B) for *generating laser beams to* illuminate a *Grating Light Valve* (402), which is an *one-dimensional spatial light modulator*, (please see Figure 10 for its one dimensional arrangement) for modulating the laser beams. The modulated laser beams are then *scanned* by a *scanning mirror* (432) to the *direction* and then the location of an observer (434) for displaying **an image**, (please see Figure 14, and columns 7-12). **Bloom** et al teaches that the *one dimensional grating light valve* has a plurality of *one-dimensionally arrayed elements* (200, Figures 7-18) that each of the elements has a *top surface* defined between the post position (110) and the *entire* top surface is selected to move upward and downward for modulating the light. The elements are *selectively* driven by applying the voltage and which means they could be independently driven as desired. It would then have been obvious to one skilled in the art to apply the teachings of **Bloom** to make the one dimensional modulator of **Kajiki** a

grating light valve having the structure explicitly stated above for the benefit of allowing the modulation of the light from the light source array with greater efficiency and control which therefore ensure the image display quality.

12. Claim 16 (newly added) is rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Kajiki, and Bloom et al as applied to claim 6 above, and further in view of the patent issued to Burr et al (PN. 5,550,779).

The three dimensional image display apparatus taught by **Kajiki** in combination of the teachings of **Bloom et al** have met all the limitations of the claims. Kajiki teaches that the scanning system comprises galvano mirror and polygonal mirror but it does not teach explicitly that is may also comprised staged mirror. **Burr** in the same field of the endeavor teaches a staged mirror, (14, 16 or 54) which can be diffractive grating elements (or therefore an holographic element), that is comprised of staged reflective elements, (please see Figures 2-4, 8 and 11) for directing light beam to different vertical direction. It would then have been obvious to one skilled in the art to modify the structure of Kajiki to use staged mirror as alternative means for scanning the light for the benefit of allowing more efficient control of the scanning of the light beams.

13. Claim 17 (newly added) is rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Kajiki, and Liu as applied to claim 7 above, and further in view of the patent issued to Burr et al (PN. 5,550,779).

The three dimensional image display apparatus taught by **Kajiki** in combination of the teachings of **Liu** have met all the limitations of the claims. Kajiki teaches that the scanning system comprises galvano mirror and polygonal mirror but it does not teach explicitly that is may also comprised staged mirror. **Burr** in the same field of the endeavor teaches a staged mirror, (14, 16 or 54) which can be

diffractive grating elements (or therefore an holographic element), that is comprised of staged reflective elements, (please see Figures 2-4, 8 and 11) for directing light beam to different vertical direction. It would then have been obvious to one skilled in the art to modify the structure of Kajiki to use staged mirror as alternative means for scanning the light for the benefit of allowing more efficient control of the scanning of the light beams.

Response to Arguments

14. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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